Automated Dog Ball Launcher: For Post-Covid Dogs
(Technical Paper)

Changes in the Music Industry Monetary Flow with Streaming Services
(STS Paper)

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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<center>**Prospectus**</center>

Introduction

As the season of quarantine slowly starts to phase out and life starts to become more normal, those who once worked remotely will now have to go back into the office, leaving their dogs at home. During the coronavirus pandemic quarantine period, families and dog owners had a chance to interact with their dogs more than they had before. Shelters could not meet the high demand for dog adoptions and sales (Kavin, 2020). The shift back to normality for dog owners leaves dogs alone at home without their families to play with them. To combat this boredom for dogs, an automated ball launcher will be built. Unlike other automated ball launchers on the market, the goal of the launcher is to teach the dog how to play with itself by automating the direction, distance, and time intervals of launch. An application can be accessed by the human user to schedule the ball launcher for a certain time throughout the day. The goal of this launcher is for the dog to play with the launcher and learn to play fetch. The dog will get exercise and a temporary relief from being home alone. The technical project deliverable is the automated dog ball launcher and a report summarizing the project and its process. The technical portion of this prospectus is not related to the research paper portion but addresses another aspect of STS.

The second proposed project in this prospectus is a research paper addressing the changes the music industry and seen with the mainstream usage of music streaming services. One of the major changes from music streaming services is the introduction of monthly revenue. The flow of money through the relevant parties of the music industry and the production of music for these services will be explored. The transition from buying physical CDs to digital copies of music and now to paying monthly fees for streaming services has been a change witnessed and experienced by those currently older than mid-twenties. Being a relevant transition caused by technology, the topic of streaming services came to light. The monetary change within the industry and for

consumers does not seem to have been explored in depth before in relation to each other, making for an STS research topic.

Technical Topic

As adults start to head back into the office, dogs will be left alone at home again back to pre-pandemic conditions. Since the 19th century, dogs have been standing steadfast beside their human counterparts by helping to hunt, acting as guard dogs, and cultivating unbreakable bonds to last a lifetime (2021). However, owning and caring for a dog is no easy task. With 48,255,413 households having dogs owned as pets in 2018 in the US, entertainment and pet health has been a priority for millions of Americans (AVMA, 2019). Dogs require physical activity, as do humans, and need care and attention. The American Kennel Club recommends that as a general guideline, most dogs need at least two hours of social time with either humans or other dogs every day (Kearl, 2021). While two hours seems like a manageable amount the busy nature of life sometimes makes it difficult to achieve this daily necessity for your pet, which can lead to problems at home. Dogs with too much alone time may be destructive, pace or pant uncontrollably, urinate or defecate in the house or excessively bark or howl due to boredom, lack of social stimulation, incomplete training, or more serious conditions like separation anxiety (2020). The coronavirus pandemic made this social time with dogs and humans a lot easier as dog owners had to stay at home, but the amount of interaction will change as dog owners go to back to the office.

With this complex situation in mind, the technical project, in cooperation with the four other members, will be designed to provide dogs having to deal substantial amounts of alone time a form of entertainment to try and prevemt conditions like separation anxiety. The project

will provide dogs with the ability to play fetch with themselves based on a scheduling system setup through a mobile application by the owner, which will alleviate some of the stress on a pet that spends most of their day alone. The main aim of the project is the dogs will be able to play with itself with the utilization of the automated launching device.

Upon investigation, there are multiple products out on the market that aim to accomplish a similar task as this project. These include but are not limited to the iFetch, PetSafe Automatic Dog Ball Launcher and the iDogMate Ball Launcher. Each one of these mechanisms has defining features and characteristics that separate them from the rest of the market. All systems currently on the market are lacking an advanced scheduling system like this project will have, and none rotate on an axis to fire in a semi-circular manner. Having the axis fire in a semi-circular manner sets this product apart from other competitors in the market and gives it distinct competitive advantages. The semi-circular manner in which the axis fires will allow the dog to have a different experience with the launcher, not making the launching direction and distance completely predictable. Having a less predictable aspect of the ball launch is what is intended to keep the dog engaged to continue playing with itself and teaching itself to play while getting in exercise. The final deliverable of the technical project is to have a functioning dog ball launcher with a report describing the technical process of the device.

STS Topic

Before the introduction of streaming services in the mid-2010s, the main methods of music consumption were digital or physical album purchases, through the radio, or through pirating (Burgress, 2014). Looking at the numbers album and song sales decreased 18.2 percent and 28.8 percent, respectively, while music streaming services increased 35.4 percent (Wang,

2019). With the wide usage of mobile phones and internet, streaming services have become successful by bringing music to any user that has access to the internet. A streaming service is an internet-based service that allows its users to stream music to their internet accessible device (Chen, 2021). Starting its appearance in the early 2000s and working its way into mainstream usage, music streaming services have taken prominence in the way music is distributed and consumed. Streaming is described with its interaction of users by access-based consumption instead of ownership-based consumption (Lee, 2020). With services like Spotify, Apple Music, and Youtube Music, a new change was brought to the music industry which had never existed before: monthly revenue (Ovide, 2021).

Technological momentum is the first theory that will help analyze the social changes introduced by the technology of music streaming and the social changes which influenced the usage of music streaming. Defined by Hughes, technological momentum is "a more complex concept than determinism and social construction, technological momentum infers that social development shapes and is shaped by technology (Hughes, 1987)." Hughes mentions the theory of technological momentum is a "more flexible mode of interpretation" in comparison with the theories of technological determinism and social construction (Hughes, 1987). With more flexibility, technological determinism gives room to say technology is shaped by society but can also shape society. In this project, technological momentum will be used to show music streaming services are an effect of a society but also a cause for changes in society.

The millennial generation is about speed and ability, creating utilizing mobile devices and other forms of technology in daily life to play music. Access is now at the fingertips from any device with internet capabilities to a vast catalogue of music, podcasts, and other forms of audio (Tschmuck, 2016). The demand for music on mobile phones increases the worldwide

reach for music streaming services, showing the demand shaping the technology which overpowers other music consumption methods (Chen, 2021). The group of music consumers has shaped what method of music consumption is prioritized, but the streaming services have also changed the music industry, with economic changes in revenue distribution (Ovide, 2021). The mainstream acceptance brought about the idea from a higher demand of music and a global reach through streaming services (Sundet & Colbjørnsen, 2021). With music streaming services, the technology is shaping the music industry, but the higher demand for music consumption allowed streaming services to be widely accepted. Technological momentum will help explain why streaming services have become mainstream along with why they are the cause of economic changes in the music industry.

Another theory used to help analyze mainstream usage of streaming services will be the paradigm shift. Paradigm shifts are all about the change of a basic concept that society holds. When Kuhn introduced the idea of a paradigm shift, it was in the context of scientific revolutions (Kuhn, 2012). Although only applied to scientific revolutions when introduced, the idea of a paradigm shift is able to be applied to other aspects of society, including shifts in how technology is viewed and used. The theory of the paradigm shift will be used in the project to support and explain the reasoning why music streaming platforms have become mainstream. The consumption of music from this access-based out of ownership-based through streaming services falls under a paradigm shift for the music consumers. Music streaming platforms make way to creators to have more opportunities and for rights holders to distribute and monetize their product by providing an online platform for different stakeholders to interact (Tschmuck, 2016). In the case of the music industry, it is consumers of music, artists, and if relevant, the company involved in producing and copyrighting their work. The platform creators and investors want

more profit, as in more users on their platform. With the highly dynamic nature of digital platforms, the everyday life of the users is affected by company objectives and tactics showing changes in what society holds as the norm (Tschmuck, 2016). A streaming service is purely access-based, making room for the paradigm shift to occur and allowing streaming services to have a global reach of music distribution (Sundet & Colbjørnsen, 2021).

Research Question and Methods:

What changes in the music industry have followed with the introduction of streaming services from an economic standpoint, and how have these changes affected the different stakeholders in the industry?

To pursue this research question, background research will first be done to see how music was produced and distributed before the introduction of streaming services. The current state of the music industry will then be analyzed and compared to its former state. Paradigm shift and technological momentum will be used to analyze the different states and explain the changes. The effects on the music industry's monetary value will also be explored. Numbers will be evaluated using discourse analysis to interpret what the numbers mean and what the trends are. Perspectives from the streaming service users will be taken into account along with the monetary value found in the industry to show the changes on the production side of music distribution through streaming. Research will be organized by the background research done, the state of the music industry now, and the supporting arguments for claims made in the project. Keywords that will be used to conduct research are "music streaming services", "changes in music economy", "music streaming technology", and "introduction of music streaming."

Conclusion

This proposal encompasses the investigation of coming out of a post coronavirus pandemic world in the relation with dog and human interaction. The need for human interaction was fulfilled and met throughout the pandemic, but as life goes back to normal, the psychology of dogs points to a possibility of separation anxiety. This design effort will aim to create a technology for dogs to entertain themselves and have interaction while their owners are away at the office. The final deliverable will be both a device and a final paper.

Addressing another aspect of STS, the research portion of this proposal is to address the economic changes of the flow of money for music streaming services, encompassing both the consumers and producers of music. It aims to answer how these changes came about and the trajectory of the effects of the mainstream usage of music streaming services. The research project will be analyzed through two different theories: paradigm shifts and technological momentum.